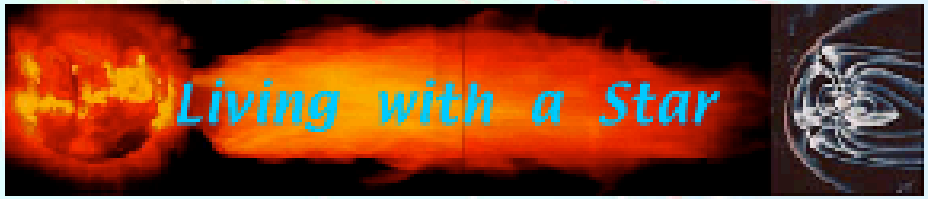
Splinter Session on Theory and Modeling
Living with a Star Community Workshop



An Incomplete Report by Tamas Gombosi
(tamas@umich.edu)

NASA GSFC
May 10-12, 2000

Caveats

- ***Short splinter session***
  - About 35 participants
  - ~2 hours
  - Limited agenda
    - Challenges and Approaches
    - Implementation
- ***Some diverging views***
  - Entropy of a closed system increases with time (or remains constant for systems in equilibrium)
  - Not enough time to converge (broadcast vs receive mode)
- ***Several areas of concensus***
- ***More discussion and community input are needed***
  - send comments to Michael Hesse (e-mail: hesse@gsfc.nasa.gov)

Challenges and Approaches

- ***The primary role of TM in the LWS program is synthesis:***
  - TM should be the "glue" which connects sparse observations
  - TM should provide the global perspective integrating the various elements of LWS into a single, coherent "Sun-to-Mud" system
  - TM must also provide the physical insight into processes
- ***TM must provide an "end-to-end" modeling approach:***
  - Some participants questioned why the TM Challenges and Approaches were divided to solar, heliospheric, magnetospheric, ionospheric and atmospheric components
  - Some confusion about data assimilation into models, but majority feels this should be a very important part of TM
- ***TM should not limit its modeling efforts to LWS flight missions***
  - Solar-Terrestrial Probes
  - Other missions and ground-based data

Implementation

- ***Options:***
  - Option 1. ISTP type TM "mission" with program level PI teams
  - Option 2. All 4 missions (SDO, Sentinels, RCM, IM) have PI level TM teams
  - Option 3. SR&T type TM teams
    - Small (~100K) type 3 year awards
    - Competed annually
  - Option 4. Some combination of the above
- ***Majority seems to favor Option 1 with some elements of Options 2 and 3 (Option 4 if you wish)***

Remarks About Option 1

- ***TM "mission":***
  - Detailed planning by a science definition team
  - TM should concentrate to large-scale overarching models but not exclude smaller, innovative, targeted investigations
  - TM PI teams should be represented at same level as instrument PIs
  - TM budget must be protected from hardware overruns
  - TM PI teams should be selected for at least 5 years
    - Long lead-time development efforts
    - Critical size groups
    - Require products and deliverables
    - Generalize "open data" policy (open code)
    - Ensure healthy competition

Additions to Option 1

- Models can be used to help flight missions to optimize observation strategy
- Empirical specification models can also play a useful role and serve the user community
- GI program to support targeted innovative research
- Large computing and data storage requirements
- Data ingestion and visualization